



LAURE

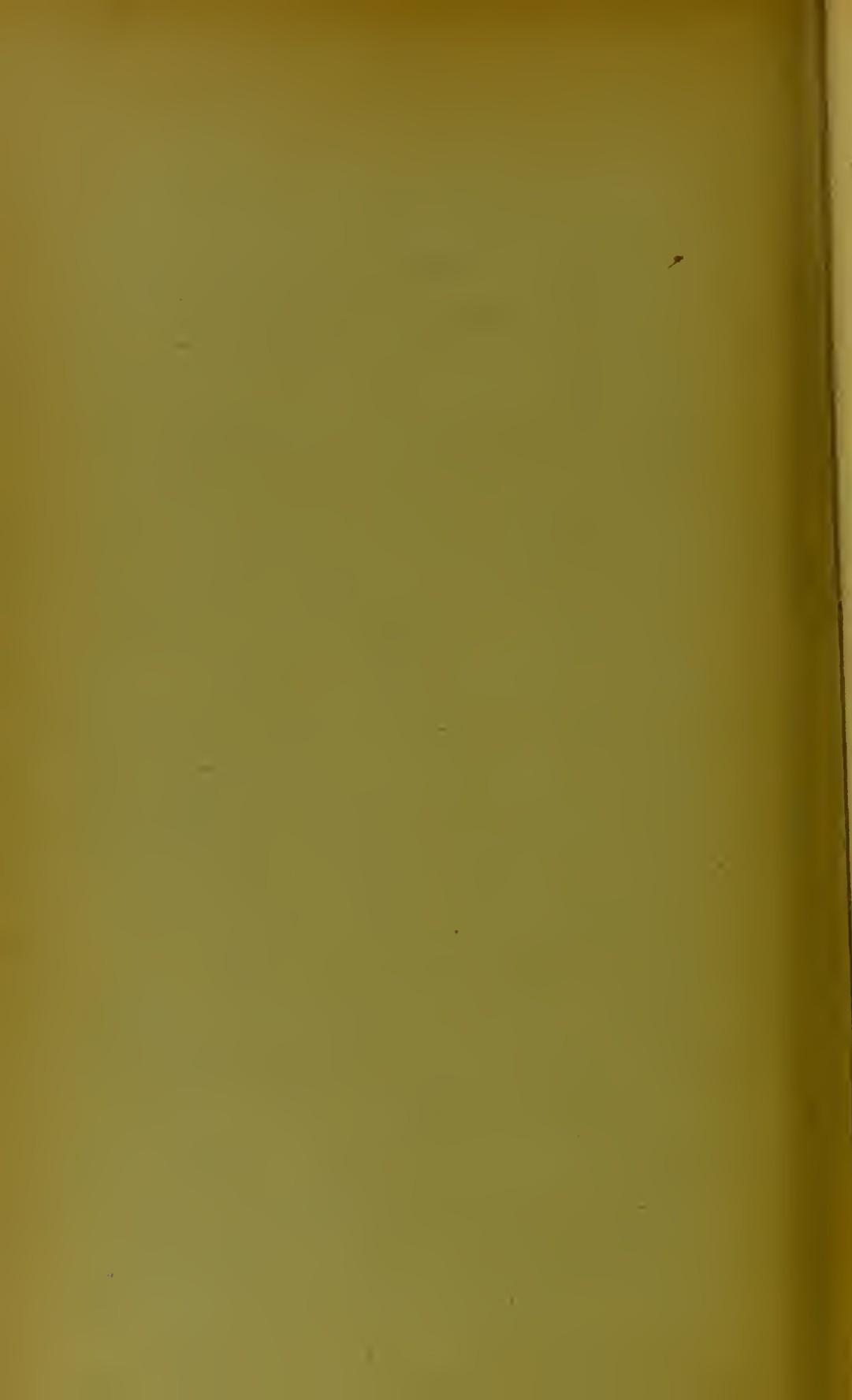
ON
THE OCCURRENCE OF AN ORGANISM
RESEMBLING THE
PLASMODIUM MALARIAE 
IN A CASE OF
MALIGNANT DISEASE OF THE BLADDER

BY

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St. Bartholomew's Hospital.

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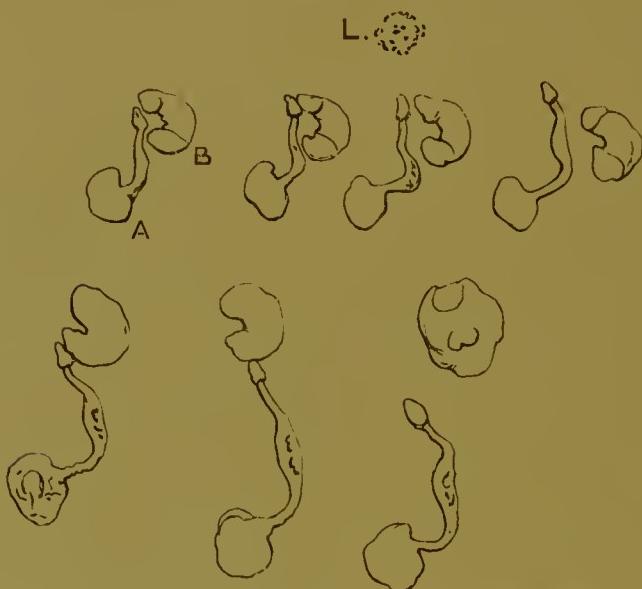
BY T. LAUDER BRUNTON, M.D., F.R.S.

A SHORT while ago when talking to my friend Dr. Ruffer he mentioned to me that he intended to examine the urine for organisms in cases of malignant disease, and I then told him what I had seen in the following case, which, as it may be of interest to others, I now record. Unfortunately no specimens of the organism were preserved and I have therefore thought it worth while to reprint the letters written at the time it was seen by two independent observers.

A man aged about sixty or sixty-five and of a very gouty diathesis began to suffer in August, 1892, from intense pain in voiding urine and great frequency of micturition. He consulted me on Dec. 6th, 1892, and perhaps I may best describe his condition by copying the report which I sent to his medical attendant: "I saw the patient on Dec. 6th. There was a curious whistling sound with inspiration in his larynx and trachea as if there was some slight obstruction in it, and a faint systolic murmur over his aorta, which I attributed to atheroma. There was some pain and tenderness over the region of the bladder and occasional pain and slight tenderness on pressure over the left kidney at the back. The specific gravity of the urine was 1020, acid and turbid. It contained a quantity of peculiar albumen. On boiling there was a thick cloud, which was not removed by acetic acid; on adding acetic acid to the unboiled urine and then boiling it there was hardly any turbidity, but there was

a heavy cloud on adding picric acid ; cold nitric acid gave a moderate cloud of a pink colour throughout. On microscopic examination I saw a very curious condition : there were numerous leucocytes in the field and several large cells, some of strangely distorted forms. From one large cell a prolongation exactly like a small serpent issued. (Fig. 1.) This

FIG. 1.



A and B are two cells. L is a leucocyte. The alterations in the snake-like organism issuing from B were so rapid that the successive drawings showing its apparent size and shape had to be done very hurriedly, and only in the fifth of them is the granular appearance of A shown, but it was present throughout and ought to have been drawn in the others if there had been time. It seemed better, instead of filling it in afterwards, to reproduce the drawings exactly as they were taken.

serpent-like structure visibly grew whilst I was examining it, and shot its head out hither and thither from the cell exactly like a snake waving the upper part of its body backwards and forwards from its resting coils. For a while this snake, if I may so call it, applied its head to another cell as if it were

sucking it, then moved its head away, and the whole organism shot rapidly across the field of the microscope. I could not see how this movement was effected ; it looked to me like ciliary motion, for the snake kept quiet all the time. The behaviour of the thing was almost like that of an infusorium of the same shape and appearance. I put the patient upon sulphite of soda and tincture of belladonna, and asked him to come back in a few days and see me again. If I do not find him better I should strongly advise him to consult a surgeon, because I am not at all easy about the condition of his bladder ; I should be much afraid of a new growth in it rather than of a stone. I am unable, however, to speak positively." On Dec. 16th I had a letter from his medical man, who suggested the possibility of the organisms that I observed having been contained in the bottle and not in the urine.

On Dec. 17th I saw the patient again, obtained fresh specimens of his urine and again found the organisms. On the 20th the patient consulted Mr. Hurry Fenwick, to whom I wrote as follows : "I enclose a short note that I wrote yesterday of the patient's case. My own impression was that it was a new growth in the bladder. I have given him sulphite of soda (fifteen grains) with ten minims of tincture of belladonna, but I shall be quite pleased for him to take the mixture you suggest. Should it not relieve his pain I should be inclined to suggest the addition of some belladonna. I found some very curious bodies in the urine, looking almost like microscopic leeches or serpents, with one end attached to a large cell a good deal bigger than a leucocyte. One of them went quite across the field of the microscope as if by ciliary motion, but they were unlike any infusoria that I have ever seen." Mr. Hurry Fenwick replied on Dec. 21st as follows : "Many thanks for your letter. It forms a valuable addition to my notes. I remarked the long-tailed cells and looked upon them as being an indication of rapid carcinomatous growth. Some of the smaller nucleated cells were throwing out pseudopodia in the most active manner. I quite

expect to find that the patient will develop cystitis in a few days, and this was one of my reasons for not sounding, for this inevitable complication would have been ascribed to the exploration rather than to the natural course of basal carcinoma."

I next saw the patient with Mr. Fenwick on Feb. 8th, 1893. On examination per rectum a hard mass was felt adhering to the right ischium, apparently about two inches and a half long by two inches broad. Nothing was felt in the rectum itself. On sounding, Mr. Fenwick felt that it was not a large encapsulated stone, but was certainly a tumour, and the diagnosis consequently was that it was malignant and the prognosis was very gloomy. The patient died on Feb. 27th, so that the progress of the case altogether was very rapid.

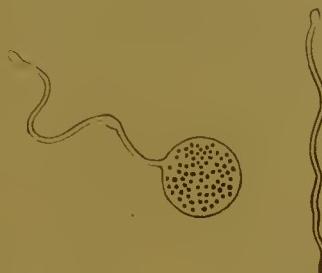
When I saw the case it did not occur to me that the moving organism observed in the urine was like the plasmodium *malariae*, but on receiving a copy of Pepper's "Text-book on Medicine," containing an excellent plate of the plasmodium, the resemblance was at once very apparent. The objection that they might have come from the bottle was fortunately raised in time by the patient's medical attendant, so that I was able to ascertain that the organisms were really obtained from the urine and not from any admixture with water which might possibly have contained them. Cells throwing out pseudopodia and much resembling the organism I observed have been noticed by Michelson¹ in cases where there was a catarrhal condition of the bladder, but he does not mention whether the catarrh depended upon the presence of malignant disease in any of those cases or not. In 1880 Gaule² described an organism somewhat like a worm which could be observed on the blood-corpuscles of the frog lying close to the nucleus. It would then push one end of its body out of the corpuscle and wriggle itself out in a spiral manner. Sometimes it remained sticking perpendicularly out of the corpuscle, drawing

¹ Virchow's Archiv.

² Archiv für Physiologie, 1880, p. 58

itself back, and at last emerged free from the corpusele. It then crawled briskly hither and thither, often dragging the blood-corpusele, attached to it by invisible threads, after it as a horse does a waggon. It would draw near to another blood-corpusele, bore into its interior, emerge from it again, push

FIG. 2.



Plasmodium malariae. (After Laveran.)

the corpusele before it, turn it on one side, and then attack another. This worm, described by Gaule, is shorter than the organism that I discovered, as it is only about half the length of the corpusele of a frog, but it agrees with it in so far that there are certain round bodies inside the worm resembling

FIG. 3.

Cells from urine, showing active amœboid movements.
(After Michelson.)

little drops or vesicles. Gaule supposed it to be a normal part of the blood-corpusele of the frog, and the serpent-like structure which I have described might possibly be only a long pseudopod. Gaule's worm was in all probability a foreign organism like the plasmodium malariae and most pro-

bably the serpent-like structure is one also, but our knowledge of the relationship between it and the plasmodium or between the plasmodium and the organism whose occurrence in a case of cancer I have just described is as yet too scanty to allow of any general conclusions being drawn. The subject of the etiology of cancer is so interesting that I have thought it worth while to note the occurrence of such an appearance as the serpent-like body issuing from a cell without making further comments upon it.

Stratford-place, W.



